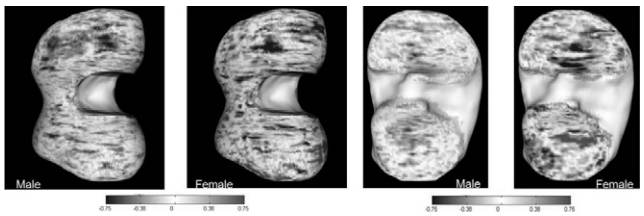

Conclusions: The amounts of change in the articular knee cartilage of this OAI progression group agreed well with other published authors The pattern of cartilage loss on both the femur and tibial plateau is broadly within the meniscal window, although the change is focal and variable. Females seem to show greater dynamic range of cartilage thickness gain as well as loss than males. This data suggests the need to treat males and females independently in any clinical study of the disease.

423 ULTRASONOGRAPHIC FINGER JOINTS EXAMINATION IN HAND OSTEOARTHRITIS

L. Mancarella[1], M. Magnani[2], O. Addimanda[1], S. Galletti[2], R. Meliconi[1]. *[1]Rheumatology Unit, Istituti Ortopedici Rizzoli, Bologna, ITALY, [2]Ultrasonology Unit, Istituti Ortopedici Rizzoli, Bologna, ITALY*

Purpose: To compare US and radiographic features in patients with hand OA (HOA).
Methods: We studied 16 outpatients with symptomatic HOA, according to ACR classification criteria. Metacarpophalangeal, distal and proximal interphalangeal joints of all patients were evaluated by ultrasound (US) examination (7.5−15 MHz linear array), performed on both hands on volar and dorsal sides. Anteroposterior conventional radiographs of both hands in all patients were performed and the radiological involvement of the single joints has been graded by Kellgren-Lawrence's (K-L) and Kallman's system. Synovial volume, power Doppler (PD) signal (present/absent), and erosions (defined as a cortical break $\geqslant$2 mm) were analyzed. Joints with ankylosis were excluded from the US evaluation. Student's T or Mann-Whitney (if no Gaussian distribution of the data) were used to compare quantitative variables.
Results: We analysed 444 joints by US; all these where assessed by K-L scoring system and 284 by Kallman's one (Kallman score does not take into account the metacarpophalangeal joints). PD positive joints were 40 (9%) out of the K-L considered ones and 32 (11%) out of the Kallman's considered ones. Joints with US detected erosions were 35 (8%) out of the K-L considered ones and 36 (13%) out of the Kallman's considered ones. Relationship between presence of PD signal and radiological scores are shown in the table. Furthermore, PD positive joints showed a higher number of US detected erosions (0.4±0.9 vs 0.2±0.6, $p = 0.017$). Patients with US detected erosions had significant higher K-L and Kallman's score ($p < 0.0001$ for both). No significant association was observed between radiological grading and synovial volume.
Conclusions: In our series of HOA patients, about 10% of the finger joints show features of inflammation and erosive disease associated with higher radiological scores. A prospective follow up study is necessary to evaluate the diagnostic and prognostic value of US examination of HOA.

Table 1: Relationship between ultrasound and radiological scores

	PD positivity	PD negativity	p
Kellgren-Lawrence's, mean, sd (CI 95%)	2.1±1.2 (1.7−2.5)	1.5±1.0 (1.4−1.6)	0.01
Kallman's, mean, sd (CI 95%)	6.2±2.0 (5.5−6.9)	5.2±2.0 (4.9−5.4)	0.05

424 RELATIONSHIP OF ADIPOSITY TO INFLAMMATORY COMPONENTS OF KNEE OSTEOARTHRITIS (OA): THE MOST STUDY

L.B. Hughes[1], R. Wallace[2], J. Niu[3], D. Felson[3], K. Javaid[4], K. Chaganti[5], C. Lewis[1]. *[1]The University of Alabama at Birmingham, Birmingham, AL, USA, [2]The University of Iowa, Iowa City, IA, USA, [3]Boston University School of Medicine, Boston, MA, USA, [4]University of Southampton, Southhampton, UNITED KINGDOM, [5]Hospital for Special Surgery, New York, NY, USA*

Purpose: Increased body mass index (BMI) is associated with incident knee osteoarthritis (OA) and knee pain severity. Biomechanical factors play a role in this association, but inflammatory mediators have also been implicated, and visceral adipose tissue is an important site of cytokine production. The Multicenter Osteoarthritis Study (MOST) is a NIH-funded longitudinal study of subjects who either have knee OA or are at high risk of developing it. Demographic and radiographic data, whole body DEXA scans and Gd-DTPA enhanced MRI of one knee were obtained. We tested for association of adipose tissue as well as weight, BMI, lean body mass (LBM)), and whole body bone mineral density (BMD) measures with MRI evidence of synovitis.
Methods: 30 month Gd-DTPA enhanced MRI images and baseline whole body DEXA (Hologic QDR-4500W) were available on 521 subjects. Fat mass (total and trunk), LBM, and total BMD were calculated utilizing DEXA. MRI synovitis (range 0−3) was scored from 6 compartments of the knee and categorized as: 0-normal; 1-mild; 2-moderate; 3-severe. BMI and weight were obtained at baseline. Predictor variables were separated into sex-specific quartiles and analyzed comparing the highest to lowest quartiles. Sex-specific univariate and multivariate ordinal logistic regression were performed.
Results: The mean age of subjects was 59.6±7.2; 50.5% were female, and 86.5% were Caucasian. Mean baseline BMI was 29.5±4.7, weight 190.7±36.3 lbs, % fat mass total 32.0±8.4, abdominal fat mass/total fat mass 49.3%±7.1%, LBM 56,563±12,694 gms, and total BMD 1.16±0.13 gm/cm^2. MRI evidence of synovitis was present in 75% of subjects.
In women, synovitis was positively associated with % fat mass total (*); however, this lost significance when adjusting for weight (**) (see Table 1). In men there was no significant association between % fat mass total and synovitis in the univariate analysis (*), but a significant inverse association was present in the model adjusted for weight (**). BMI, weight and LBM were positively associated with synovitis in women. In men, only LBM and total BMD were positively associated with synovitis.
Conclusions: We did not find an independent positive association between fat mass and knee synovitis. The sex-based differences observed highlight the possibility of different pathological pathways playing different roles among men and women.

Table 1: Association of body size measures and synovitis

Predictor	Synovitis* Women OR (95% CI), P value	Synovitis** Women (weight adj.) OR (95% CI), P value	Synovitis* Men OR (95% CI), P value	Synovitis** Men (weight adj.) OR (95% CI), P value
BMI	4.0 (2.0−7.9) P < 0.0001	3.2 (0.6−16.1) P = 0.1674	1.7 (0.9−3.3) P = 0.1272	1.2 (0.2−5.9) P = 0.8459
Weight (kg)	2.5 (1.2−4.9) P = 0.0094	X	2.0 (0.9−4.2) P = 0.0755	X
% fat mass total	2.9 (1.5−5.7) P = 0.0018	1.4 (0.5−3.5) P = 0.5127	0.6 (0.3−1.2) P = 0.1224	0.2 (0.1−0.5) P = 0.0010
Abdfat/total body fat	1.4 (0.7−2.7) P = 0.2807	1.0 (0.5−1.9) P = 0.9320	1.3 (0.6−2.5) P = 0.4805	1.0 (0.5−2.0) P = 0.9466
Lean mass total (gm)	3.3 (1.6−6.9) P = 0.0014	1.0 (0.3−3.1) P = 0.9960	3.3 (1.5−7.3) P = 0.0037	4.5 (1.4−14.6) P = 0.0127
Bone density total (gms/cm^2)	1.6 (0.8−3.2) P = 0.1610	1.5 (0.8−3.0) P = 0.2472	2.9 (1.4−6.0) P = 0.0037	2.8 (1.4−5.8) P = 0.0055

*Adj. for age, race, height; **Adj. for age, race, height, and weight

425 ASSESSMENT OF BONE MARROW EDEMA-LIKE LESIONS AND CARTILAGE DEGENERATION IN OSTEOARTHIRITS USING 3T MR T1RHO QUANTIFICATION

J. Zhao[1,2], T.M. Link[1], R.I. Bolbos[1], S. Majumdar[1], X. Li[1]. *[1]Musculoskeletal Quantitative Imaging Research (MQIR) group, Department of Radiology, University of California San Francisco, San Francisco, CA, USA, [2]The Third Hospital of Hebei Medical University, Shijiazhuang, CHINA*

Purpose: To quantitatively assess the relationship between bone marrow edema-like lesions (BMEL) and the associated cartilage in knee osteoarthritis (OA) using $T_{1\rho}$ quantification at 3T MRI.
Methods: Twenty-three patients (10 male, 13 female, mean age 51.8±11.2 years) with clinically diagnosed knee OA underwent MRI at 3T (Signa, GE Medical Systems). Radiographs were also obtained and scored based on Kellgren-Lawrence (KL) scales (number of patients = 10, 10, 2, 1 for KL = 1, 2, 3, 4 respectively). Clinical symptoms were quantified using Western Ontario and McMaster University (WOMAC) scores in all patients. The MRI protocol included sagittal intermediate-weighted fat-saturated FSE images, sagittal 3D water excitation high-resolution SPGR images and sagittal 3D $T_{1\rho}$ quantitation sequences previously developed in our lab. BMEL were semi-automatically segmented in FSE images